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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 14

Application Number: 09/203894
Filing Date: 12/02/98
Appellant(s): MIGDAL et al

JAMES L. LEWIS
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed October 27, 2000.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The amendments of August 7, 2000 (paper no. 7) and August 30, 2000 (paper no. 9) were not entered because of non compliance with 37 CFR 1.121. The faxed amendment filed December 13, 2000 which obviated the problems posed by the non-entered amendments was entered. The appendix to this answer contains the all the claims on appeal including those amended in the December 13, 2000 communication. Hence the claims on appeal are claims 1-5, 7,8, 10-19,21,22 and 24-28.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-5,7,8,10-19,21,22 and 24-28 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

As stated supra the copy of the appealed claims appearing in the appendix attached to this answer contains the properly copied set of claims on appeal.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

2647824	Jones	8/53
4692258	Rasberger et al	9/87
4965006	Meier et al	10/90
5246606	Evans	9/93

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-5,7,8,10-19,21,22 and 24-28 stand rejected under 35 U.S.C. 103(a). This rejection is set forth in prior office action, paper no. 3 dated March 29, 2000.

(11) Response to Argument

Cognizant that in conformance with the instant dihydroquinoline's accurate depiction on both page 6 of the specification and in the appealed claims, that the depiction of the 2,2,4 trialkyl 1,2 dihydroquinolines on page 4 of the Appeal Brief should have H directly attached to N to fulfill its trivalency, the traversal on pages 4-7 vis-a-vis Rasberger's and Jones' purported lack of pertinency lacks merit. The gist of the contention (page 7, second paragraph) is that said references teach **" that the 1,2,3,4- tetrahydroquinolines were superior to the dihydroquinolines when used with phenolics"** rather than teaching the interchangeableness

of 1,2- dihydroquinolines with 1,2,3,4-tetrahydroquinolines as asserted by the examiner. Be that as it may, the traversal fails to address the issue which is: Assuming arguendo the propriety of applicants' counsel's concession (tetrahydroquinolines plus phenol > dihydroquinoline plus phenol), where have applicants established the any anomalousness exists, in relative reduced effectiveness to tetrahydroquinolines plus phenol, in their use of a dihydroquinoline with a phenolic antioxidant ?

Moreover regarding the expectancy here of *dihydroquinolines* synergism with diarylamines , as alternates to phenol synergists, based upon amines or phenols proven synergistic effects on *tetrahydroquinolines* as previously disclosed by Jones and subsequently confirmed by Evans, Meier and Rasberger, the traversal directed to Rasberger is untenable in its characterization that Rasberger directs arylamines' conjoint use *only* when a phenolic antioxidant is also present with the hydrogenated quinoline (Appeal Brief: page 8, first paragraph). This attribution to Rasberger of a tertiary comprised stabilizer system (phenol, amine , tetrahydroquinoline) as the only alternative to the hydrogenated quinoline's use per se or combined with a phenol, is a misinterpretation of Rasberger's disclosure. Rasberger discloses and claims a composition minimally comprising a mineral oil, a synthetic oil, a hydraulic fluid or a lubricating grease and the tetrahydroquinoline preservative.Preferably a phenolic antioxidant is present, but not required. Thus col.4, lines 33-38 relates that a phenolic antioxidant's conjoint presence represents a " preferred embodiment". Seen in this context, the proceeding text's recitation of other optional materials (col.4, lines 55-68) including aromatic

amines such as dioctyldiphenyl amine or N, N'-sec. butyl p-phenylenediamine , all species within applicants genus (claims 7,14,21 and 28), reveals that similarly **Rasberger taught aromatic amines as alternatives to phenols in promoting the effectiveness of the hydrogenated quinolines including dihydro forms (col.1) as well as tetrahydro forms (col.4)**. Rasberger's inadvertent misnomering of compound (4) in col.2, line 58 as a dihydro-quinoline derivative rather a tetrahydroquinoline compound does not detract away from the examiner's point (expected synergism of dihydroquinolines with phenols **or** amines) , in as much as the accuracy of Rasberger's previous adknowledgement (col.1, lines 21-30) of utilizing 1,2-dihydroquinolines with a phenolic antioxidant in lubricating oils, has not been disputed.

For the reasons advanced above the final rejection should be sustained.

Conferees:

Vasu Jagannathan Vasu Jagannathan

Robert Dawson Robert A. Dawson

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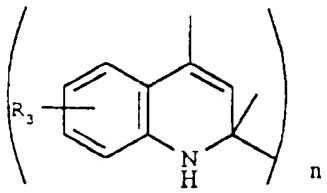
APPENDIX

1. A composition comprising lubricating oil and at least a first antioxidant and a second antioxidant, the first antioxidant being a secondary diarylamine of the formula R_1-NH-R_2 where R_1 and R_2 each independently represent a substituted or unsubstituted aryl group having from 6 to 46 carbon atoms and the second antioxidant being a 2,2,4-trialkyl-1,2-dihydroquinoline or a polymer thereof of the structure:



where n=1-1000 and R_3 is hydrogen, alkyl, or alkoxy.

2. The composition of claim 1 wherein the lubricating oil is selected from the group consisting of polyol esters, diesters, phthalate esters, trimellitate esters, pyromellitate esters, dimer acid esters, and polyoleates.

3. The composition of claim 1 wherein the lubricating oil is an API Group I base oil.

4. The composition of claim 1 wherein the lubricating oil is an API Group II base oil.

5. The composition of claim 1 wherein the lubricating oil is an API Group IV base oil.

7. The composition of claim 1 wherein the first antioxidant is selected from the group consisting of diphenylamine, monoalkylated diphenylamine, dialkylated diphenylamine, trialkylated diphenylamine, or mixtures thereof, 3-hydroxydiphenylamine, 4-hydroxydiphenylamine, mono- and/or di-butyldiphenylamine, mono- and/or di-octyldiphenylamine, mono- and/or di-nonyldiphenylamine, phenyl-α-naphthylamine, phenyl-β-naphthylamine, diheptyldiphenylamine, mono- and/or di-(α-methylstyryl)diphenylamine, mono- and/or distyryldiphenylamine, 4-(*p*-toluenesulfonamido)diphenylamine, 4-isopropoxydiphenylamine, t-octylated N-phenyl-1-naphthylamine, mixtures of mono- and dialkylated t-butyl-t-octyldiphenylamines, N-phenyl-1,2-phenylenediamine, N-phenyl-1,4-phenylenediamine, N,N'-diphenyl-*p*-phenylenediamine, N,N'-di(naphthyl-2)-*p*-phenylenediamine, N-isopropyl-N'-phenyl-p-phenylenediamine, N-(1,3-dimethylbutyl)-N'-phenyl-*p*-phenylenediamine, N-(1-methylheptyl)-N'-phenyl-*p*-phenylenediamine, and N-cyclohexyl-N'-phenyl-*p*-phenylenediamine.

8. The composition of claim 1 wherein the second antioxidant is 2,2,4-trimethyl-1,2-dihydroquinoline or a polymer thereof.

10. The composition of claim 8 wherein the amount of 2,2,4-trimethyl-1,2-dihydroquinoline or polymer thereof is in the range of about 0.01 to about 10 weight percent.

11. The composition of claim 1 wherein the amount of secondary diarylamine is in the range of from about 0.01 to about 10 weight percent.

12. The composition of claim 1 wherein the ratio the first antioxidant to the second antioxidant is from 1:99 to 99:1.

13. The composition of claim 1 further comprising at least one additional additive selected from the group comprising dispersants, detergents, rust inhibitors, antioxidants, metal deactivators, antiwear agents, antifoamants, friction modifiers, seal swell agents, demulsifiers, VI improvers, and pour point depressants.

14. A composition comprising:

a lubricating oil selected from the group consisting of polyol esters, diesters, phthalate esters, trimellitate esters, pyromellitate esters, dimer acid esters, polyoleates, an API Group I base oil, an API Group II base oil, and an API Group IV base oil,

from about 0.01 to about 10 weight percent of at least one first antioxidant selected from the group consisting of diphenylamine, monoalkylated diphenylamine, dialkylated diphenylamine, trialkylated diphenylamine, or mixtures thereof,

3-hydroxydiphenylamine, 4-hydroxydiphenylamine, mono- and/or di-butyldiphenylamine, mono- and/or di-octyldiphenylamine, mono- and/or di-nonyldiphenylamine, phenyl-α-naphthylamine, phenyl-β-naphthylamine, diheptyldiphenylamine, mono- and/or di-(α-methylstyryl)diphenylamine, mono- and/or distyryldiphenylamine, 4-(*p*-toluenesulfonamido)diphenylamine, 4-isopropoxydiphenylamine, t-octylated N-phenyl-1-naphthylamine, mixtures of mono- and dialkylated t-butyl-t-octyldiphenylamines, N-phenyl-1,2-phenylenediamine, N-

16. The method of claim 15 wherein the lubricating oil is selected from the group consisting of polyol esters, diesters, phthalate esters, trimellitate esters, pyromellitate esters, dimer acid esters, and polyoleates.

17. The method of claim 15 wherein the lubricating oil is an API Group I base oil.

18. The method of claim 15 wherein the lubricating oil is an API Group II base oil.

19. The method of claim 15 wherein the lubricating oil is an API Group IV base oil.

21. The method of claim 15 wherein the first antioxidant is selected from the group consisting of diphenylamine, mono-alkylated diphenylamine, dialkylated diphenylamine, trialkylated diphenylamine, or mixtures thereof, 3-hydroxydiphenylamine, 4-hydroxydiphenylamine, mono- and/or di-butyldiphenylamine, mono- and/or di-octyldiphenylamine, mono- and/or di-nonyldiphenylamine, phenyl-α-naphthylamine, phenyl-β-naphthylamine, diheptyldiphenylamine, mono- and/or di-(α-methylstyryl)diphenylamine, mono- and/or distyryldiphenylamine, 4-(*p*-toluenesulfonamido)diphenylamine, 4-isopropoxydiphenylamine, t-octylated N-phenyl-1-naphthylamine, mixtures of mono- and dialkylated t-butyl-t-octyldiphenylamines, N-phenyl-1,2-phenylenediamine, N-phenyl-1,4-phenylenediamine, N,N'-diphenyl-*p*-phenylenediamine, N,N'-di(naphthyl-2)-*p*-phenylenediamine, N-isopropyl-N'-phenyl-*p*-phenylenediamine, N-(1,3-dimethylbutyl)-N'-

phenyl-*p*-phenylenediamine, N-(1-methylheptyl)-N'-phenyl-*p*-phenylenediamine, and N-cyclohexyl-N'-phenyl-*p*-phenylenediamine.

22. The method of claim 15 wherein the second antioxidant is 2,2,4-trimethyl-1,2-dihydroquinoline or a polymer thereof.

24. The method of claim 22 wherein the amount of 2,2,4-trimethyl-1,2-dihydroquinoline or polymer thereof is in the range of from about 0.01 to about 10 weight percent.

25. The method of claim 15 wherein the amount of secondary diarylamine is in the range of about 0.01 to about 10 weight percent.

26. The method of claim 15 wherein the ratio the first antioxidant to the second antioxidant is from 1:99 to 99:1.

27. The method of claim 15 further comprising at least one additional additive selected from the group comprising dispersants, detergents, rust inhibitors, antioxidants, metal deactivators, antiwear agents, antifoamants, friction modifiers, seal swell agents, demulsifiers, VI improvers, and pour point depressants.

28. A method of increasing the oxidation stability of a lubricating oil selected from the group consisting of polyol esters, diesters, phthalate esters, trimellitate esters, pyromellitate esters, dimer acid esters, polyoleates, an API Group I base oil, an API Group II base oil, and an API Group IV base oil, comprising adding thereto: from about 0.01 to about 10 weight percent of at least one first antioxidant selected from the group consisting of diphenylamine, mono-alkylated diphenylamine, dialkylated diphenylamine, trialkylated diphenylamine, or mixtures thereof, 3-hydroxydiphenylamine, 4-hydroxydiphenylamine, mono- and/or di-butyldiphenylamine, mono- and/or di-octyldiphenylamine, mono- and/or di-nonyldiphenylamine, phenyl-α-naphthylamine, phenyl-β-naphthylamine, diheptyldiphenylamine, mono- and/or di-(α-methylstyryl)diphenylamine, mono- and/or distyryldiphenylamine, 4-(*p*-toluenesulfonamido)diphenylamine, 4-isopropoxydiphenylamine, t-octylated N-phenyl-1-naphthylamine, mixtures of mono- and dialkylated t-butyl-t-octyldiphenylamines, N-phenyl-1,2-phenylenediamine, N-phenyl-1,4-phenylenediamine, N,N'-diphenyl-*p*-phenylenediamine, N,N'-di(naphthyl-2)-*p*-phenylenediamine, N-isopropyl-N'-phenyl-*p*-phenylenediamine, N-(1,3-dimethylbutyl)-N'-phenyl-*p*-phenylenediamine, N-(1-methylheptyl)-N'-phenyl-*p*-phenylenediamine, and N-cyclohexyl-N'-phenyl-*p*-phenylenediamine, from about 0.01 to about 10 weight percent of a second antioxidant that is 2,2,4-trimethyl-1,2-dihydroquinoline or a polymer thereof, the ratio of the first antioxidant to the second antioxidant being from 1:99 to 99:1, and, optionally,

at least one additional additive selected from the group comprising dispersants, detergents, rust inhibitors, antioxidants, metal deactivators, antiwear agents, antifoamants, friction modifiers, seal swell agents, demulsifiers, VI improvers, and pour point depressants.